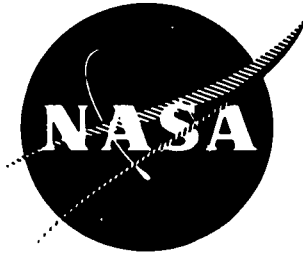


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OR 12,641



**THESAURUS OF TERMS  
FOR INFORMATION ON  
MECHANICS OF STRUCTURAL FAILURE**

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**CASE FILE  
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**prepared for**

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16. Abstract  This Thesaurus is comprised of approximately 700 subject terms used to describe the six problem areas in the mechanics of structural failure. The initial criteria for the selection of terms are their significance and frequency of use in the literature describing the mechanics of structural failure.  The purpose of the Thesaurus is to provide the Aerospace Safety Research and Data Institute a list of key words and identifiers that afford effective retrieval of information regarding failure modes and mechanisms for aerospace structures. The Thesaurus includes both a conventional listing of subject terms and a Key Words In Context (KWIC) listing.					
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## FOREWORD

This **Thesaurus of Terms** is comprised of the subject terms used to describe six problem areas in the mechanics of structural failure as defined in the Introduction. A modified version of the definitions, conventions, and cross-reference structure that appear in the NASA Thesaurus (NASA SP-7040) is used; however, a significant number of new terms are introduced.

The initial criteria for the selection of terms are their significance and frequency of use in the literature describing the mechanics of structural failure.

The purpose of the thesaurus is to provide the Aerospace Safety Research and Data Institute a list of key words and identifiers that afford effective retrieval of information from the Aerospace Safety Data Bank\* regarding failure modes and mechanisms for aerospace structures.

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\*Located at the NASA Lewis Research Center, Cleveland, Ohio 44135

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## INTRODUCTION

This Thesaurus of Terms is an alphabetical listing of subject terms (postable and nonpostable) identified during a literature search of the six problem areas listed below:

- I. **Life prediction of materials at high temperatures and exposed to monotonic and cyclic loading** – Includes information on low cycle and thermal fatigue particularly as it applies to turbine buckets in the gas turbine engine and high cycle fatigue data for materials used in components such as engine bearings.
- II. **Fracture toughness data on various structural materials** – Available data are categorized with respect to test methods,  $K_{Ic}$  versus  $K_c$ , and other peculiar parameters considered by the investigators. In particular, data derived from ASTM standard tests are identified.
- III. **Fracture mechanics analyses – capabilities and limitations** – A significant amount of publications deal with linear elastic fracture mechanics which assumes plane strain. Attempts were made to identify any work that was done, taking into account elastic-plastic theories.
- IV. **Hydrogen embrittlement of superalloys** – This subject is of interest regarding turbine buckets, which are exposed to high temperatures. It will be of increasing importance if additional interest develops in using hydrogen as the fuel in gas turbine engines.
- V. **Protective coatings** – Airbreathing engines operating in contaminated environments are in need of protection against attack by the contaminants. Information on the various candidate coatings and the effects of combustion products of contaminants in jet fuels on engine components is of prime interest. For example, the sulfur ordinarily contained in JP fuels reacts with salt present in shipboard and offshore environments and the resulting compounds attack turbine buckets severely.
- VI. **Composite materials data on low cycle and thermal fatigue** – Our aim here is to search for data related to composite structural materials.

The Thesaurus of Terms is divided into two parts. Part I is a conventional listing of terms, using a modified form of the conventions used in the NASA Thesaurus (NASA SP-7040). Part II is a rearrangement of the same terms into a Key Words in Context (KWIC) listing to group all related terms. In both listings, an asterisk (\*) has been used to identify words or phrases which are not in the September 1971 edition of the NASA Thesaurus.

## DEFINITIONS AND CONVENTIONS

The definitions and conventions employed in the development of the thesaurus follow.

**Term Selection.** Subject terms have been chosen on the basis of their significance and use in the literature on the mechanics of structural failure and their utility in enabling information retrieval. Particular consideration has been given to the indexing in the NASA Thesaurus (NASA SP-7040), however, new terms have been added when such terms will facilitate retrieval. An asterisk (\*) has been used to denote new terms. For example:

\*COMPRESSIVE LOADS

**Singular vs Plural.** The plural form has in general been used for subject terms. The singular form, however, is occasionally used for specific processes, properties, conditions, or hardware.

**Grammatical Form.** Subject terms are presented in the noun form.

**Punctuation.** An effort has been made to minimize the use of punctuation within subject terms. When it is used it becomes an integral part of the term.

**Term Length.** No more than 42 characters, including spaces and punctuation, are used for any subject term.

**Term Ambiguity.** When subject terms can have more than one meaning in aerospace usage, clarification is provided by the addition of a parenthetical qualifying expression which becomes part of the subject term. For example:

FAILURES (MATERIALS)  
FATIGUE (MATERIALS)

**Direct Entry.** Subject terms that consist of more than one word are listed for direct entry, i.e., in their natural word order rather than in their inverted form. For example:

AERODYNAMIC HEATING, not HEATING, AERODYNAMIC

**Abbreviations and Acronyms.** Abbreviations and acronyms that are in common use in the aerospace community are employed in this listing. In most cases USE cross-references are made from the unabridged forms. For example:

NONDESTRUCTIVE TESTING  
USE NDT

**Synonyms.** When candidate subject terms are true synonyms, one is chosen to be the valid or postable term and the other is provided with a USE cross-reference. For example:

FRACTURE TOUGHNESS  
USE FRACTURE STRENGTH

**Array Terms.** Subject terms with ambiguous meanings or that are too broad for effective indexing or retrieval of information have been designated array terms and carry the following scope note. (USE A MORE SPECIFIC TERM -- CONSULT THE TERMS LISTED BELOW). Relationships with other postable terms are shown by denoting USE preferences.

**Identifiers.** Identifiers, i.e., subject terms that include a numerical or alphabetical designation or both are treated as regular subject terms. Identifiers are terms assigned to projects, programs, hardware, nicknames, trade names, etc. For example:

NASA IIB7  
RENE 41  
UDIMET 700

## **CROSS-REFERENCE STRUCTURE**

Three cross-reference structures are used in this Thesaurus of Terms. In Part I, use (USE) and used for (UF) references are shown for all true synonyms and, also, an array structure is used to minimize ambiguity for broad terms. In Part II, the Key Words in Context (KWIC) listing collects related noun forms making no distinction between singular or plural, gerund, gerundive, etc. These cross-references have the following specific applications.

**Use (USE).** This indicates that the term is not "postable," i.e., not a valid term and the following term or terms should be used instead. For example:

FRACTURE TOUGHNESS  
USE FRACTURE STRENGTH

**Used for (UF).** This is a reciprocal of the USE cross-reference and identifies valid, or "postable," terms. For example:

FRACTURE STRENGTH  
UF FRACTURE TOUGHNESS

**Array Terms.** This cross-reference structure is used to identify "postable" subject terms that represent more specific concepts than the term used. To this extent, while they are not true synonyms, they are the reciprocal of the broader term. For example:

MECHANICAL PROPERTIES  
(USE A MORE SPECIFIC TERM -- CONSULT THE TERMS LISTED BELOW)  
USE ABRASION RESISTANCE  
BRITTLENESS  
CREEP STRENGTH  
DUCTILITY  
YIELD POINT

**Key Words in Context (KWIC).** The KWIC cross-reference structure collects all related noun forms included in the thesaurus, including both postable and nonpostable terms. For example:

TESTS  
CREEP TESTS  
NOTCH TESTS  
TEST RESULTS  
TESTING METHODS  
WIND TUNNEL TESTS

Single terms, i.e., those that do not appear elsewhere in the thesaurus in another noun form, are not included in the KWIC listing. For example:

ADSORPTION

Identifiers that include a numerical or alphabetical designation, or both, are not included in the KWIC listing. For example:

B 1900  
PRD 49  
RENE 41

## **ALPHABETIZATION**

A modified computer sorting has been used in the alphabetization of subject terms in this Thesaurus of Terms. The resulting arrangement closely resembles the word-by-word arrangement while simultaneously providing a standard numerical sequence for the numbered terms.

**PART I**  
**ALPHABETICAL LISTINGS**  
**OF SUBJECT TERMS**  
**(A – Z)**



# A

ABRASION  
 ABRASION RESISTANCE  
 ACCEPTABILITY  
   UF    ACCEPTANCE  
 ACCEPTANCE  
   USE    ACCEPTABILITY  
 \*ACCIDENT ANALYSES  
 ACCIDENT INVESTIGATION  
 ACCIDENT PREVENTION  
   UF    PRECAUTIONS  
 \*ACCIDENT PREVENTION MANUALS  
 \*ACCIDENT REPORTS  
 ACCIDENTS  
 ACOUSTIC FATIGUE  
   UF    SONIC FATIGUE  
 \*ACOUSTICAL CRACKS  
 ADSORPTION  
 AERODYNAMIC HEATING  
 AERODYNAMIC LOADS  
 AERODYNAMICS  
 AEROELASTICITY  
 AEROTHERMOELASTICITY  
   UF    THERMOAEROELASTICITY  
 AEROSPACE VEHICLES  
 \*AF2-IDA  
 AIRCRAFT  
 AIRCRAFT DESIGN  
 AIRCRAFT STABILITY  
 AIRCRAFT STRUCTURES  
 ALARMS  
   USE    WARNING SYSTEMS  
 \*ALLOWABLE STRESSES  
 ALLOYS  
   UF    METAL ALLOYS  
       (USE A MORE SPECIFIC TERM--  
       CONSULT THE TERMS LISTED BELOW)  
   USE    ALUMINUM ALLOYS  
           BEARING ALLOYS  
       \*BE-CU ALLOY 25  
       BERYLLIUM ALLOYS  
       BETA II TITANIUM  
       BINARY ALLOYS  
       CHROMIUM ALLOYS  
       COBALT ALLOYS  
       HAFNIUM ALLOYS  
       \*HASTELLOYS  
       HEAT RESISTANT ALLOYS  
       HIGH STRENGTH ALLOYS  
       \*INCOLOY 800  
       \*INCONEL ALLOYS  
       \*INCONEL 617  
       \*INCONEL 625

\*INCONEL 700  
 \*INCONEL 706  
 \*INCONEL 713  
 \*INCONEL 718  
 \*INCONEL 722  
 \*INCONEL X  
 \*INCONEL X-750  
 \*M 252  
   MAGNESIUM ALLOYS  
 \*MAR M200  
   MARAGING STEEL  
 \*MILD STEELS  
   MOLYBENUM ALLOYS  
 \*MP 35M  
 \*MW 171G  
 \*NASA IIB  
 \*NASA IIB-7  
 \*NASA IIB-11  
 \*NICHROME 5  
   NICKEL ALLOYS  
   NIMONIC ALLOYS  
   NIOBIUM ALLOYS  
   REFRACTORY METAL ALLOYS  
   RENE 41  
   RENE 63  
   RENE 77  
 \*RENE 95  
 \*RENE 120  
   RHENIUM ALLOYS  
 \*SAP ALLOYS  
   STAINLESS STEELS  
   STEELS  
   STELLITES  
   TANTALUM ALLOYS  
   TERNARY ALLOYS  
   TITANIUM ALLOYS  
   TUNGSTEN ALLOYS  
   UDIMET ALLOYS  
 \*UDIMET 500  
 \*UDIMET 630  
 \*UDIMET 700  
   WASPALLOY  
  
 ALUMINUM  
 ALUMINUM ALLOYS  
 ALUMINUM OXIDES  
 \*ANALYSIS METHODS  
 \*ANALYSIS TOOLS  
   ANISOTROPY  
   ANODIC COATINGS  
 \*ANTI-PLANE SHEAR  
   USE    SHEAR  
   APPLICATION  
   USE    UTILIZATION

ASSEMBLY  
 \*ASSEMBLY PROCEDURES  
 \*ASSEMBLY SPECIFICATIONS  
 ATMOSPHERES  
 ATMOSPHERIC ENTRY  
 AXIAL COMPRESSION LOADS  
 AXIAL LOADS  
 AXIAL STRAIN  
   UF     UNIAXIAL STRAIN  
 AXIAL STRESS  
   UF     UNIAXIAL STRESS

## B

\*B 1900  
 BALL BEARINGS  
 BAUSCHINGER EFFECT  
 BEARING ALLOYS  
 \*BEARING LIFE  
 \*BEARING LOADS  
 BEARINGS  
 \*BE-CU ALLOY 25  
 \*BEND TESTS  
 BENDING  
 BENDING FATIGUE  
 \*BENDING LOADS  
 BENDING MOMENTS  
 \*BENDING VIBRATION  
 BERYLLIUM  
 BERYLLIUM ALLOYS  
 BETA II TITANIUM  
 \*BIAXIAL PROPERTIES  
 \*BIAXIAL STRESS  
 BIBLIOGRAPHIES  
 BINARY ALLOYS  
 \*BLAST RESISTANCE  
 \*BLAST RESISTANCE CRITERIA  
 BOLTS  
 \*BORIDE COMPOSITES  
 \*BORIDE Z  
 BORON  
 \*BRITTLE FRACTURE  
 BRITTLENESS  
 BUCKLING  
   UF     COMPRESSIVE BUCKLING

## C

\*CALIBRATION STANDARDS  
 CARBON  
 CARBON FIBERS  
 CASTINGS  
 \*CATASTROPHES  
 \*CATHODIC PROTECTION

\*CERAMAL PROTECTIVE COATINGS  
   USE     PROTECTIVE COATINGS  
 CERAMALS  
   USE     CERMETS  
 CERAMIC COATINGS  
 CERAMICS  
 CERMETS  
   UF     CERAMALS  
 \*CHARPY IMPACT TESTS  
 \*CHECK LISTS  
   CHEMICAL COMPOSITION  
 \*CHEMICAL DETECTION  
 \*CHEMICAL HAZARDS  
 CHEMICAL MACHINING  
   UF     CHEMICAL MILLING  
 CHEMICAL MILLING  
   USE     CHEMICAL MACHINING  
 CHEMICAL REACTIONS  
 CHROMIUM  
 CHROMIUM ALLOYS  
 CLADDING  
 \*CLEANING PROCEDURES  
 CLEAVAGE  
 COATINGS  
   UF     INORGANIC COATINGS  
           (USE A MORE SPECIFIC TERM--  
           CONSULT THE TERMS LISTED BELOW)  
   USE     ANODIC COATINGS  
           CERAMIC COATINGS  
           \*DIFFUSION COATINGS  
           OXIDATION RESISTANT COATINGS  
           OXIDE COATINGS  
           PHOTOELASTIC COATINGS  
           PLASTIC COATING  
           PROTECTIVE COATINGS  
           \*SILICIDE COATINGS

COBALT  
 COBALT ALLOYS  
 CODES  
 COFFIN COEFFICIENT  
 COFFIN-MANSON LAW  
 \*COLUMBIUM ALLOYS  
   USE     NIOBIUM ALLOYS  
 \*COMBINED LOADS  
 COMBINED STRESS  
 \*COMBUSTIBLE MATERIALS  
 COMBUSTION INSTABILITY  
   USE     COMBUSTION STABILITY  
 COMBUSTION STABILITY  
   UF     COMBUSTION INSTABILITY

COMPATIBILITY  
 \*COMPATIBLE MATERIALS  
 \*COMPLEX SHAPES  
 \*COMPONENT FAILURES  
 COMPOSITE MATERIALS  
   UF COMPOSITES  
 COMPOSITE STRUCTURES  
 COMPOSITES  
   USE COMPOSITE MATERIALS  
 COMPRESSIVE BUCKLING  
   USE BUCKLING  
 \*COMPRESSIVE LOADS  
 COMPRESSIVE STRENGTH  
 COMPUTER PROGRAMS  
 CONFIDENCE LIMITS  
 \*CONFIGURATION TESTS  
 CONNECTIONS  
   USE JOINTS (JUNCTIONS)  
 \*CONSTANT LOADS  
 \*CONSTRUCTION SPECIFICATIONS  
 CONTAMINANTS  
 CONTAMINATED ENVIRONMENTS  
 CONTAMINATION  
 \*CORRECTIVE ACTION  
 CORROSION  
 \*CORROSION INHIBITORS  
 CORROSION PREVENTION  
 CORROSION RESISTANCE  
 \*CRACK ANALYSIS  
 \*CRACK DETECTION  
 CRACK FORMATION  
   USE CRACK INITIATION  
 CRACK INITIATION  
   UF CRACK FORMATION  
 CRACK PROPAGATION  
 \*CRACK TIP PLASTIC ZONE  
 CRACKS  
 \*CREEP  
 CREEP ANALYSIS  
 CREEP PROPERTIES  
   (USE A MORE SPECIFIC TERM--  
   CONSULT THE TERMS LISTED BELOW)  
   USE SHEAR CREEP  
   TENSILE CREEP  
 CREEP RESISTANCE  
   USE CREEP STRENGTH  
 \*CREEP RUPTURE  
 CREEP RUPTURE STRENGTH  
   UF STRESS RUPTURE STRENGTH  
 CREEP STRENGTH  
   UF CREEP RESISTANCE  
 \*CREEP STRENGTH DIAGRAMS

CREEP TESTS  
 CRITERIA  
 \*CRITICAL FLAW SIZE  
 CRYOGENICS  
 CUMULATIVE DAMAGE  
 \*CUMULATIVE EFFECTS  
 CYCLE LOADS  
   USE CYCLIC LOADS  
 \*CYCLIC CREEP  
 CYCLIC LOADS  
   UF CYCLE LOADS  
 \*CYCLIC TEMPERATURES  
   USE THERMAL CYCLES  
 \*CYCLIC TESTING  
 CYCLIC TORSION  
 CYLINDRICAL SHELLS

## D

DAMAGE  
 \*DAMAGED STRUCTURE LIFE  
 DANGER  
   USE HAZARDS  
 DEFECTS  
   USE MATERIAL DEFECTS  
 DEFLECTION  
 DEFORMATION  
 \*DENSITY (PROPERTIES)  
 DESIGN  
 \*DESIGN CODES  
 \*DESIGN CRITERIA  
 \*DESIGN GUIDES  
 \*DESIGN PROCEDURES  
 \*DESIGN STANDARDS  
 \*DETECTION SYSTEMS  
 \*DIBORIDES  
 DIFFUSION  
 \*DIFFUSION COATINGS  
 DIRECTORIES  
 DISASTERS  
 \*DISCONTINUITIES  
   USE MATERIAL DEFECTS  
 \*DISPERSION STRENGTHENED MATERIALS  
 \*DISSIMILAR MATERIALS BONDING  
 \*DISTORTION  
 \*DUCTILE-BRITTLE TRANSITION  
 \*DUCTILE FRACTURE  
 DUCTILITY  
 DYNAMIC LOADS  
 \*DYNAMIC STRESSES  
 DYNAMIC TESTS

**E**

EDDY CURRENTS  
EFFECTS

(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)

USE BAUSCHINGER EFFECT  
\*CUMULATIVE EFFECTS  
ENVIRONMENTAL EFFECTS  
\*FREQUENCY EFFECTS  
\*JET ENGINE FUEL EFFECTS  
\*NOTCH EFFECTS  
TEMPERATURE EFFECTS

ELASTIC MODULUS

USE MODULUS OF ELASTICITY

ELASTICITY

USE ELASTIC PROPERTIES

\*ELASTIC-PLASTIC ANALYSIS

\*ELASTIC-PLASTIC MODULUS

USE MODULUS OF ELASTICITY

ELASTIC PROPERTIES

UF ELASTICITY  
INELASTICITY

(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)

USE AEROELASTICITY  
AEROTHERMOELASTICITY  
MODULUS OF ELASTICITY  
PHOTOELASTICITY  
THERMOELASTICITY

ELASTIC STABILITY

ELECTRON MICROSCOPY

ELECTROPLATING

ELONGATION

UF TENSILE ELONGATION

EMBRITTLMENT

\*ENGINEERING STANDARDS

\*ENVIRONMENTAL CAPABILITY

ENVIRONMENTAL EFFECTS

ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL TESTS

ENVIRONMENTS

EPOXY COMPOUNDS

EPOXY RESINS

\*EROSION RESISTANCE

\*EXCESSIVE PRESSURES

\*EXCESSIVE VIBRATIONS

\*EXPECTED LIFE

\*EXPERIMENTAL DATA

EXTRUSION METHODS

\*EXTRUSIONS

**F**

FABRICATION

\*FABRICATION METHODS

\*FABRICATION STANDARDS

\*FACTOR OF SAFETY

\*FAIL-SAFE DESIGN

FAILURE

FAILURE ANALYSES

\*FAILURE INVESTIGATIONS

\*FAILURE MECHANISM

\*FAILURE MODE

\*FAILURE PREVENTION

\*FAILURE REPORTS

\*FAILURES (MATERIALS)

FASTENERS

FATIGUE (MATERIALS)

UF STRUCTURAL FATIGUE

FATIGUE DIAGRAMS

USE S-N DIAGRAMS

STRESS-STRAIN DIAGRAMS

FATIGUE LIFE

FATIGUE PROPERTIES

FATIGUE STRENGTH

\*FATIGUE TESTING MACHINES

FATIGUE TESTS

FAULT MECHANICS

USE FRACTURE MECHANICS

\*FEDERAL REGULATIONS

\*FIBER-REINFORCED COMPOSITES

FIBER STRENGTH

FIBERS

UF GLASS FIBERS

\*FIELD INSPECTION TECHNIQUES

FINITE ELEMENT ANALYSIS

\*FLAT PANELS

FLAT PLATES

FLAWS

USE MATERIAL DEFECTS

FLIGHT TESTS

FLUTTER

FOREIGN BODIES

FORGINGS

\*FRACTURE ANALYSIS

FRACTURE MECHANICS

UF FAULT MECHANICS

MOHR CIRCLES

\*FRACTURE PROPERTIES

USE MECHANICAL PROPERTIES

FRACTURE RESISTANCE

USE FRACTURE STRENGTH

FRACTURE STRENGTH  
   UF     FRACTURE RESISTANCE  
         FRACTURE TOUGHNESS  
 \*FRACTURE TESTS  
 FRACTURE TOUGHNESS  
   USE     FRACTURE STRENGTH  
 FRACTURES (MATERIALS)  
 FRAGMENTATION  
 \*FRAGMENTATION DISPERSALS  
 \*FREQUENCY EFFECTS  
 FUEL CORROSION  
 \*FUSED SILICA  
 FUSELAGES

## G

GAS TURBINE ENGINES  
 GLASS FIBERS  
   USE     FIBERS  
 \*GRAPHITE-EPOXY SYSTEMS  
 GRIFFITH CRACK  
 \*GROUND-TO-AIR CYCLES  
 \*GUIDES  
   (USE A MORE SPECIFIC TERM--  
   CONSULT THE TERMS LISTED BELOW)  
   USE     \*DESIGN GUIDES  
           \*INSPECTION GUIDES  
           \*SAFETY GUIDES  
 GUST LOADS

## H

HAFNIUM  
 HAFNIUM ALLOYS  
 HANDBOOKS  
 HARDNESS  
 \*HASTELLOYS  
 HAZARDS  
   UF     DANGER  
         SAFETY HAZARDS  
 HEAT  
 HEAT CONDUCTION  
 HEAT EFFECTS  
   USE     TEMPERATURE EFFECTS  
 \*HEAT OF DEGRADATION  
 HEAT RESISTANT ALLOYS  
   UF     HIGH TEMPERATURE ALLOYS  
         SUPERALLOYS  
 HEAT SHIELDING  
 HEAT TREATMENT

HIGH-CYCLE FATIGUE  
 HIGH PRESSURE  
 HIGH SPEED  
 HIGH STRENGTH  
 HIGH STRENGTH ALLOYS  
 HIGH TEMPERATURE  
 HIGH TEMPERATURE ALLOYS  
   USE     HEAT RESISTANT ALLOYS  
 HIGH TEMPERATURE ENVIRONMENTS  
 HIGH TEMPERATURE MATERIALS  
   USE     REFRACTORY MATERIALS  
 HIGH TEMPERATURE TESTS  
 \*HONEYCOMB SANDWICH PANELS  
 \*HOT CORROSION  
   UF     SULFIDATION  
 HUMIDITY  
 HYDROGEN  
 \*HYDROGEN EMBRITTLEMENT  
 \*HYDROGEN ENVIRONMENT EMBRITTLEMENT  
 \*HYDROGEN REACTION EMBRITTLEMENT  
 HYPERVELOCITY IMPACT

## I

IMPACT  
 IMPACT STRENGTH  
 IMPERFECTIONS  
   USE     MATERIAL DEFECTS  
 IMPLOSIONS  
 IMPURITIES  
 \*INCOLOY 800  
 \*INCONEL ALLOYS  
 \*INCONEL X  
 \*INCONEL X750  
 \*INCONEL 617  
 \*INCONEL 625  
 \*INCONEL 700  
 \*INCONEL 706  
 \*INCONEL 713  
 \*INCONEL 718  
 \*INCONEL 722  
 INDEXES  
   (USE A MORE SPECIFIC TERM--  
   CONSULT THE TERMS LISTED BELOW)  
   USE     BIBLIOGRAPHIES  
           DIRECTORIES  
           INDEXES (DOCUMENTATION)  
           KWIC INDEXES  
 INDEXES (DOCUMENTATION)  
 INELASTICITY  
   USE     ELASTIC PROPERTIES  
 INFLUENCE COEFFICIENTS  
 INORGANIC COATINGS  
   USE     COATINGS

- \*INORGANIC BONDED COMPOSITES
- INSPECTION
- \*INSPECTION GUIDES
- \*INSPECTION STANDARDS
- INSTALLATION MANUALS
- \*INSTALLATION PROCEDURES
- \*INSTRUCTION MANUALS

## J

- \*JET ENGINE FUEL EFFECTS
- UF    \*JET FUEL EFFECTS
- \*JET FUEL EFFECTS
- USE    \*JET ENGINE FUEL EFFECTS
- JOINTS (JUNCTIONS)
- UF    CONNECTIONS

## K

KWIC INDEXES

## L

- LABORATORY
- \*LABORATORY SIMULATIONS
- \*LABORATORY TESTS
- LAMINATED MATERIALS
- USE    LAMINATES
- LAMINATES
- UF    LAMINATED MATERIALS
- LANDINGS
- \*LATTICE DIFFUSION
- LAUNCHINGS
- \*LEAK DETECTION
- \*LEAK TESTING
- LEAKAGE
- LIFE (DURABILITY)
- \*LIFE EXPECTANCY
- \*LIFE PREDICTION
- \*LINEAR DAMAGE RULE
- \*LOAD CYCLES
- LOAD DISTRIBUTION (FORCES)
- LOADS (FORCES)
- (USE A MORE SPECIFIC TERM--
- CONSULT THE TERMS LISTED BELOW)
- USE    AERODYNAMIC LOADS
- AXIAL COMPRESSION LOADS
- AXIAL LOADS
- \*BEARING LOADS
- \*BENDING LOADS
- \*COMPRESSIVE LOADS
- CYCLIC LOADS

- DYNAMIC LOADS
- RANDOM LOADS
- \*SHEAR LOADS
- STATIC LOADS
- \*TORSIONAL LOADS

- \*LOW-CYCLE FATIGUE
- \*LOW DENSITY MATERIALS
- \*LOW STRENGTH STEELS
- LOW TEMPERATURE
- LOW TEMPERATURE TESTS
- LUBRICANTS

## M

- \*M 252
- MACHINING
- MAGNESIUM
- MAGNESIUM ALLOYS
- MAINTENANCE
- \*MAINTENANCE METHODS
- \*MAINTENANCE STANDARDS
- MANGANESE
- MANGANESE ALLOYS
- MANUALS
- (USE A MORE SPECIFIC TERM--
- CONSULT THE TERMS LISTED BELOW)
- USE    \*ACCIDENT PREVENTION MANUALS
- \*INSTALLATION MANUALS
- \*SAFETY MANUALS
- \*TECHNICAL MANUALS
- \*MAR M200
- MARAGING STEEL
- \*MARGIN OF SAFETY
- MARS ATMOSPHERE
- \*MATERIAL DEFECTS
- UF    DEFECTS
- DISCONTINUITIES
- FLAWS
- IMPERFECTIONS
- \*MATERIAL DEGRADATION
- \*MATERIAL FRACTURES
- \*MATERIAL PROCESSING
- MATERIALS
- \*MATERIALS COMPATIBILITY
- \*MEAN STRESS
- MECHANICAL PROPERTIES
- UF    FRACTURE PROPERTIES
- (USE A MORE SPECIFIC TERM--
- CONSULT THE TERMS LISTED BELOW)
- USE    ABRASION RESISTANCE
- AEROELASTICITY
- AEROTHERMOELASTICITY

BRITTLENESS  
 COMPRESSIVE STRENGTH  
 CREEP PROPERTIES  
 CREEP RUPTURE STRENGTH  
 CREEP STRENGTH  
 DUCTILITY  
 ELASTIC PROPERTIES  
 FATIGUE LIFE  
 FIBER STRENGTH  
 FRACTURE STRENGTH  
 HARDNESS  
 HIGH STRENGTH  
 IMPACT STRENGTH  
 MODULUS OF ELASTICITY  
 NOTCH SENSITIVITY  
 NOTCH STRENGTH  
 PHOTOELASTICITY  
 PLASTIC PROPERTIES  
 POISSON RATIO  
 \*RESIDUAL STRENGTH  
 RESILIENCE  
 SHEAR CREEP  
 SHEAR PROPERTIES  
 SHEAR STRENGTH  
 STIFFNESS  
 STRENGTH  
 \*STRENGTH RETENTION  
 STRESS RATIO  
 STRESS RELAXATION  
 STRUCTURAL STABILITY  
 TENSILE CREEP  
 TENSILE PROPERTIES  
 TENSILE STRENGTH  
 THERMAL RESISTANCE  
 TOUGHNESS  
 WELD STRENGTH  
 YIELD POINT  
 YIELD STRENGTH

#### METAL ALLOYS

USE ALLOYS

METAL FOILS

METAL MATRIX COMPOSITES

\*METALLIC MATERIALS

METALLOGRAPHY

#### METALS

(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)

USE ALUMINUM  
 BERYLLIUM  
 CHROMIUM  
 COBALT  
 HAFNIUM

MAGNESIUM  
 MANGANESE  
 MOLYBDENUM  
 NICKEL  
 NIOBIUM  
 REFRACTORY METALS  
 RHENIUM  
 TANTALUM  
 TITANIUM  
 TUNGSTEN

#### METHODS

(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)

USE \*ANALYSIS METHODS  
 \*FABRICATION METHODS  
 \*MAINTENANCE METHODS  
 \*NDE METHODS  
 \*NDI METHODS  
 \*NDT METHODS  
 \*STIFFNESS METHODS  
 \*TESTING METHODS

\*MICROSTRUCTURES

\*MILD STEELS

MINER RULE

USE PALMGREN-MINER RULE

MODULUS OF ELASTICITY

UF ELASTIC MODULUS  
 ELASTIC-PLASTIC MODULUS  
 YOUNG MODULUS  
 YOUNGS MODULUS

MOHR CIRCLES

USE FRACTURE MECHANICS

MOLYBDENUM

MOLYBDENUM ALLOYS

\*MONOTONIC STRESS

\*MP 35N

\*MW 171G

#### N

\*NASA IIB

\*NASA IIB-7

\*NASA IIB-11

\*NDE

UF NONDESTRUCTIVE EVALUATION

\*NDE METHODS

\*NDE TECHNIQUES

\*NDI

UF NONDESTRUCTIVE INSPECTION

\*NDI METHODS

\*NDI TECHNIQUES

\*NDT

UF NONDESTRUCTIVE TESTING

- \*NDT METHODS
- \*NDT TECHNIQUES
- \*NICHROME 5
- NICKEL
- NICKEL ALLOYS
- NIMOMIC ALLOYS
- NIOBIUM
- NIOBIUM ALLOYS
- UF COLUMBIUM ALLOYS
- \*NONMETALLIC MATERIALS
- NOTCH
- \*NOTCH EFFECTS
- NOTCH SENSITIVITY
- NOTCH STRENGTH
- UF NOTCH TOUGHNESS
- NOTCH TESTS
- \*NOTCH TOUGHNESS
- USE NOTCH STRENGTH
- \*NOTCHED SPECIMENS
- \*NYLON

## O

- \*OPERATING MANUALS
- \*OPERATING PROCEDURES
- \*OPERATING STANDARDS
- OPERATIONS
- OSCILLATIONS
- \*OVERHAUL
- \*OVERHAUL MANUALS
- \*OVERHAUL PROCEDURES
- \*OVERLOAD
- \*OVERPRESSURIZATION
- \*OVERSTRESS
- OXIDATION
- OXIDATION RESISTANCE
- \*OXIDATION RESISTANT COATINGS
- \*OXIDE COATINGS

## P

- PALMGREN-MINER RULE
- UF MINER RULE
- \*PANELS (STRUCTURAL)
- \*PERFORMANCE CRITERIA
- PERFORMANCE PREDICTION
- \*PERFORMANCE STANDARDS
- PERTURBATIONS
- \*PHOTOELASTIC COATINGS
- PHOTOELASTIC MATERIALS
- \*PHOTOELASTIC MEASUREMENTS
- PHOTOELASTICITY

PHYSICAL PROPERTIES  
(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)

- USE CREEP
- DEFORMATION
- \*DENSITY (PROPERTIES)
- MECHANICAL PROPERTIES
- \*PLANE STRAIN
- \*PLANE STRAIN FRACTURE TOUGHNESS
- \*PLANE STRESS
- PLASTIC COATINGS
- PLASTIC DEFORMATION
- PLASTIC PROPERTIES
- UF PLASTICITY
- \*PLASTIC STRAIN
- \*PLASTIC ZONE
- PLASTICITY
- USE PLASTIC PROPERTIES
- PLASTICS
- POISSON RATIO
- UF POISSONS RATIO
- POISSONS RATIO
- USE POISSON RATIO
- POLYMERS
- POROSITY
- \*POSTBUCKLING
- POWDER METALLURGY
- \*PRD 49
- PRECAUTIONS
- USE ACCIDENT PREVENTION
- PRECIPITATION HARDENING
- UF STRAIN AGING
- \*PRE-CRACKED SPECIMENS
- PRESSURE
- UF SURFACE PRESSURE
- PRESSURE OSCILLATIONS
- \*PRESSURE TANKS
- \*PRESSURE VESSEL CODES
- PRESSURE VESSELS
- \*PRESSURIZATION
- PROCEDURES
- (USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)
- USE \*ASSEMBLY PROCEDURES
- CLEANING PROCEDURES
- DESIGN PROCEDURES
- INSTALLATION PROCEDURES
- OPERATING PROCEDURES
- \*OVERHAUL PROCEDURES
- PROGRAMED LOADS
- \*PROOF TESTS
- PROPELLANT TANKS



## PROPERTIES

(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)

USE \*BIAXIAL PROPERTIES  
CREEP PROPERTIES  
ELASTIC PROPERTIES  
FATIGUE PROPERTIES  
\*FRACTURE PROPERTIES  
MECHANICAL PROPERTIES  
PHYSICAL PROPERTIES  
PLASTIC PROPERTIES  
SURFACE PROPERTIES  
TENSILE PROPERTIES  
THERMAL PROPERTIES

## PROTECTIVE COATINGS

UF \*CERAMAL PROTECTIVE COATINGS  
\*PROTECTIVE DEVICES

## R

\*RANDOM LOAD CYCLES  
RANDOM LOADS  
\*RECOMMENDED PRACTICES  
\*REDUNDANT SYSTEMS  
REFRACTORY MATERIALS  
UF HIGH TEMPERATURE MATERIALS  
REFRACTORY METAL ALLOYS  
REFRACTORY METALS  
REGULATIONS  
REINFORCEMENT (STRUCTURES)  
RELIABILITY  
RELIABILITY ANALYSIS  
RENE 41  
RENE 63  
RENE 77  
\*RENE 80  
\*RENE 85  
\*RENE 95  
\*RENE 100  
\*RENE 120  
\*REPAIR  
\*REPLACEMENT  
\*RESIDUAL STRENGTH  
\*RESIDUAL STRESS  
RESILIENCE  
RESIN BONDED COMPOSITES  
RESINS  
RESISTANCE  
RESISTANCE HEATING  
RESONANCE  
\*REWORK  
RHENIUM

RHENIUM ALLOYS  
RIGID STRUCTURES  
RIGIDITY  
ROLLER BEARINGS  
ROLLING  
\*ROLLING ELEMENT FATIGUE LIFE  
RUPTURING

## S

S-N DIAGRAMS  
UF FATIGUE DIAGRAMS  
SAFETY  
\*SAFETY CODES  
\*SAFETY CRITERIA  
SAFETY DEVICES  
\*SAFETY DIRECTIVES  
SAFETY FACTORS  
\*SAFETY GUIDES  
SAFETY HAZARDS  
USE HAZARDS  
SAFETY MANAGEMENT  
\*SAFETY MANUALS  
\*SAFETY POLICIES  
\*SAFETY PRACTICES  
\*SAFETY PRINCIPLES  
\*SAFETY REGULATIONS  
\*SAFETY SPECIFICATIONS  
\*SAFETY STANDARDS  
\*SAFETY SYSTEMS  
\*SAFETY TECHNOLOGY  
\*SALT WATER INGESTION  
SANDWICH STRUCTURES  
\*SAP ALLOYS  
SHEAR  
UF ANTI-PLANE SHEAR  
SHEAR CREEP  
\*SHEAR LIP  
\*SHEAR LOADS  
SHEAR PROPERTIES  
SHEAR STRAIN  
SHEAR STRENGTH  
SHEET METAL  
\*SHELL BUCKLING  
SHELLS (STRUCTURAL FORMS)  
SHOCK  
SHOCK WAVES  
\*SILICIDE COATINGS  
SILICON  
\*SONIC FATIGUE  
USE ACOUSTIC FATIGUE

SPACECRAFT  
 SPECIFICATIONS  
 SPHERICAL SHELLS  
 SPIRAL WRAPPING  
 SPLINES  
 STABILITY  
 STAINLESS STEELS  
 \*STANDARD OPERATING PROCEDURES  
 STANDARDS  
     (USE A MORE SPECIFIC TERM--  
     CONSULT THE TERMS LISTED BELOW)  
 USE   \*CALIBRATION STANDARDS  
       \*DESIGN STANDARDS  
       \*ENGINEERING STANDARDS  
       \*FABRICATION STANDARDS  
       \*INSPECTION STANDARDS  
       \*MAINTENANCE STANDARDS  
       \*OPERATING STANDARDS  
       \*SAFETY STANDARDS  
       \*STANDARD OPERATING PROCEDURES  
       \*TESTING STANDARDS  
 \*STATIC CRACK GROWTH  
 STATIC LOADS  
 STATIC TESTS  
 STATISTICAL ANALYSIS  
 \*STATISTICAL DATA  
 STATISTICAL PROBABILITY  
 \*STEEL BALLS  
 STEELS  
 STELLITES  
 STIFFNESS  
 \*STIFFNESS METHODS  
 \*STORAGE TESTS  
 \*STRAIN  
 \*STRAIN ACCUMULATION  
 STRAIN AGING  
     USE   PRECIPITATION HARDENING  
 STRAIN DISTRIBUTION  
     USE   STRESS CONCENTRATION  
 \*STRAIN ENERGY RELEASE  
 STRAIN HARDENING  
 STRAIN RATE  
 STRENGTH  
 \*STRENGTH RETENTION  
 \*STRESS  
 STRESS ANALYSIS  
 STRESS CONCENTRATION  
     UF    STRAIN DISTRIBUTION  
           STRESS DISTRIBUTION  
 STRESS CORROSION  
 \*STRESS CORROSION CRACKING

STRESS DISTRIBUTION  
     USE   STRESS CONCENTRATION  
 \*STRESS INTENSITY FACTOR  
 STRESS MEASUREMENT  
 \*STRESS RAISERS  
 STRESS RATIO  
 STRESS RELAXATION  
 \*STRESS RUPTURE  
 STRESS RUPTURE STRENGTH  
     USE   CREEP RUPTURE STRENGTH  
 STRESS-STRAIN DIAGRAMS  
     UF    FATIGUE DIAGRAMS  
 STRUCTURAL ANALYSIS  
 STRUCTURAL DESIGN  
 STRUCTURAL DYNAMICS  
 STRUCTURAL ENGINEERING  
 STRUCTURAL FAILURE  
 STRUCTURAL FATIGUE  
     USE   FATIGUE (MATERIALS)  
 STRUCTURAL RIGIDITY  
     USE   STRUCTURAL STABILITY  
 STRUCTURAL SAFETY  
 STRUCTURAL STABILITY  
     UF    STRUCTURAL RIGIDITY  
 STRUCTURES  
     (USE A MORE SPECIFIC TERM--  
     CONSULT THE TERMS LISTED BELOW)  
 USE    AIRCRAFT STRUCTURES  
       CYLINDRICAL SHELLS  
       \*HONEYCOMB SANDWICH PANELS  
       \*MICROSTRUCTURES  
       \*PRESSURE TANKS  
       PRESSURE VESSELS  
       PROPELLANT TANKS  
       RIGID STRUCTURES  
       SANDWICH STRUCTURES  
       SHELLS (STRUCTURAL FORMS)  
       SPHERICAL SHELLS  
       WELDED STRUCTURES  
 \*SUBCRITICAL CRACK GROWTH  
 SULFIDATION  
     USE   HOT CORROSION  
 SULFUR  
 \*SULFUR PENETRATION  
 SUPERALLOYS  
     USE   HEAT RESISTANT ALLOYS  
 \*SURFACE CONDITIONS  
 SURFACE CRACKS  
 SURFACE DEFECTS  
 SURFACE FINISHING  
     UF    SURFACE TREATMENT

SURFACE PRESSURE  
USE PRESSURE  
SURFACE PROPERTIES  
\*SURFACE TREATMENT  
USE SURFACE FINISHING  
\*SYSTEM DESIGN  
\*SYSTEM SAFETY

## T

TANTALUM  
TANTALUM ALLOYS  
\*TECHNICAL MANUALS  
\*TEFLON  
TEMPERATURE  
\*TEMPERATURE CYCLES  
USE \*THERMAL CYCLES  
TEMPERATURE DISTRIBUTION  
TEMPERATURE EFFECTS  
UF HEAT EFFECTS  
THERMAL EFFECTS  
\*TEMPERATURE LIMITATIONS  
\*TEMPERING TEMPERATURE  
TENSILE CREEP  
\*TENSILE ELONGATION  
USE ELONGATION  
\*TENSILE LOADS  
USE TENSILE STRESS  
TENSILE PROPERTIES  
TENSILE STRENGTH  
TENSILE STRESS  
UF \*TENSILE LOADS  
\*TENSION TESTS  
TERNARY ALLOYS  
\*TEST RESULTS  
\*TESTING METHODS  
\*TESTING SPECIFICATIONS  
\*TESTING STANDARDS  
TESTS  
(USE A MORE SPECIFIC TERM--  
CONSULT THE TERMS LISTED BELOW)  
USE \*BEND TESTS  
\*CHARPY IMPACT TESTS  
\*CONFIGURATION TESTS  
CREEP TESTS  
DYNAMIC TESTS  
FATIGUE TESTS  
FLIGHT TESTS  
\*FRACTURE TESTS  
HIGH TEMPERATURE TESTS  
\*LABORATORY TESTS  
LOW TEMPERATURE TESTS  
NOTCH TESTS

PROOF TESTS  
STATIC TESTS  
\*STORAGE TESTS  
\*TENSION TESTS  
VIBRATION TESTS  
\*WIND TUNNEL TESTS

THEORIES  
THERMAL CONDUCTIVITY  
\*THERMAL CYCLES  
UF CYCLIC TEMPERATURES  
TEMPERATURE CYCLES  
THERMAL EFFECTS  
USE TEMPERATURE EFFECTS  
THERMAL ENVIRONMENTS  
THERMAL EXPANSION  
THERMAL FATIGUE  
THERMAL PROPERTIES  
THERMAL PROTECTION  
THERMAL RESISTANCE  
THERMAL SHOCK  
THERMAL STABILITY  
THERMAL STRESSES  
THERMOAEROELASTICITY  
USE AEROTHERMOELASTICITY  
THERMOELASTICITY  
THERMOELECTRICITY  
\*THERMOMECHANICAL ANALYSIS  
\*THERMOMECHANICAL PROCESSING  
THIN PLATES  
\*THORIUM OXIDES  
\*THORNEL-400  
THREE DIMENSIONAL COMPOSITES  
TITANIUM  
TITANIUM ALLOYS  
TORQUE  
\*TORSIONAL LOADS  
\*TORSIONAL STIFFNESS  
TORSIONAL STRESS  
TOUGHNESS  
TRANSIENT HEATING  
TUNGSTEN  
TUNGSTEN ALLOYS  
TURBINE BLADES  
TURBINES  
TURBULENCE

## U

\*UARL-344  
UDIMET ALLOYS  
\*UDIMET 500  
\*UDIMET 630

\*UDIMET 700  
 \*ULTIMATE STRENGTH  
 UNIAXIAL STRAIN  
 USE      AXIAL STRAIN  
 \*UNIAXIAL STRESS  
 USE      AXIAL STRESS  
 \*USEFUL LIFE  
 UTILIZATION  
 UF      APPLICATION

V

\*VACUUM ANNEALING  
 \*VARIABLE TEMPERATURE  
 VIBRATION  
 VIBRATION TESTS

W

WARNING DEVICES  
 WARNING SIGNALS  
 WARNING SYSTEMS  
 WASPALOY

WAVE PROPAGATION  
 \*WEIGHT SAVINGS  
 WELD STRENGTH  
 WELDED STRUCTURES  
 WELDING  
 \*WIND TUNNEL TESTS  
 WING PANELS  
 \*WIRES

X

X-RAY DIFFRACTION

Y

YIELD POINT  
 YIELD STRENGTH  
 YIELD STRESS  
 YOUNG MODULUS  
 USE      MODULUS OF ELASTICITY  
 YOUNGS MODULUS  
 USE      MODULUS OF ELASTICITY

**PART II**  
**KEY WORDS IN CONTEXT**

## A

ABRASION  
    ABRASION  
    ABRASION RESISTANCE  
ACCEPTANCE  
    ACCEPTABILITY  
    ACCEPTANCE  
ACCIDENTS  
    \*ACCIDENT ANALYSES  
    ACCIDENT INVESTIGATION  
    ACCIDENT PREVENTION  
    \*ACCIDENT PREVENTION MANUALS  
    \*ACCIDENT REPORTS  
    ACCIDENTS  
AERODYNAMICS  
    AERODYNAMIC HEATING  
    AERODYNAMIC LOADS  
    AERODYNAMICS  
AEROSPACE  
    AEROSPACE  
    AEROSPACE VEHICLES  
AIRCRAFT  
    AIRCRAFT  
    AIRCRAFT DESIGN  
    AIRCRAFT SAFETY  
    AIRCRAFT STABILITY  
    AIRCRAFT STRUCTURES  
ALLOYS  
    ALLOYS  
    ALUMINUM ALLOYS  
    BEARING ALLOYS  
    \*BE-CU ALLOY 25  
    BERYLLIUM ALLOYS  
    BINARY ALLOYS  
    CHROMIUM ALLOYS  
    COBALT ALLOYS  
    COLUMBIUM ALLOYS  
    HAFNIUM ALLOYS  
    HEAT RESISTANT ALLOYS  
    HIGH STRENGTH ALLOYS  
    INCONEL ALLOYS  
    MAGNESIUM ALLOYS  
    MANGANESE ALLOYS  
    METAL ALLOYS  
    MOLYBDENUM ALLOYS  
    NICKEL ALLOYS  
    NIMONIC ALLOYS  
    NIOBIUM ALLOYS  
    REFRACTORY METAL ALLOYS  
    RHENIUM ALLOYS  
    \*SAP ALLOYS

SUPERALLOYS  
TANTALUM ALLOYS  
TERNARY ALLOYS  
TITANIUM ALLOYS  
TUNGSTEN ALLOYS  
UDIMET ALLOYS

ALUMINUM  
    ALUMINUM  
    ALUMINUM ALLOYS  
    ALUMINUM OXIDES  
ANALYSIS  
    \*ACCIDENT ANALYSES  
    ANALYSIS  
    \*ANALYSIS METHODS  
    \*ANALYSIS TOOLS  
    \*CRACK ANALYSIS  
    CREEP ANALYSIS  
    \*ELASTIC-PLASTIC ANALYSIS  
    FAILURE ANALYSES  
    FINITE ELEMENT ANALYSIS  
    \*FRACTURE ANALYSIS  
    RELIABILITY ANALYSIS  
    STATISTICAL ANALYSIS  
    STRESS ANALYSIS  
    STRUCTURAL ANALYSIS  
    \*THERMOMECHANICAL ANALYSIS  
ASSEMBLY  
    ASSEMBLY  
    ASSEMBLY PROCEDURES  
    ASSEMBLY SPECIFICATIONS  
ATMOSPHERES  
    ATMOSPHERES  
    ATMOSPHERIC ENTRY  
    MARS ATMOSPHERE

## B

BEARINGS  
    BALL BEARINGS  
    BEARING ALLOYS  
    \*BEARING LIFE  
    \*BEARING LOADS  
    BEARINGS  
    ROLLER BEARINGS  
BENDING  
    BENDING  
    BENDING FATIGUE  
    \*BENDING LOADS  
    BENDING MOMENTS  
    BENDING TEST  
    \*BENDING VIBRATION

## BLAST

- BLAST
- \*BLAST RESISTANCE
- \*BLAST RESISTANCE CRITERIA

## C

### CARBON

- CARBON
- CARBON FIBERS

### CHEMICAL

- CHEMICAL
- CHEMICAL COMPOSITION
- \*CHEMICAL DETECTION
- \*CHEMICAL HAZARDS
- CHEMICAL MACHINING
- CHEMICAL MILLING
- CHEMICAL REACTIONS

### COATINGS

- ANODIC COATINGS
- \*CERAMAL PROTECTIVE COATINGS
- CERAMIC COATINGS
- COATINGS
- \*DIFFUSION COATINGS
- INORGANIC COATINGS
- \*OXIDATION RESISTANCE COATINGS
- \*OXIDE COATINGS
- \*PHOTOELASTIC COATINGS
- PLASTIC COATING
- PROTECTIVE COATINGS
- \*SILICIDE COATINGS

### CODES

- CODES
- \*DESIGN CODES
- \*PRESSURE VESSEL CODES
- \*SAFETY CODES

### COMPOSITES

- \*BORIDE COMPOSITES
- COMPOSITE MATERIALS
- COMPOSITE STRUCTURES
- COMPOSITES
- \*FIBER-REINFORCED COMPOSITES
- \*INORGANIC BONDED COMPOSITES
- METAL MATRIX COMPOSITES
- RESIN BONDED COMPOSITES
- THREE DIMENSIONAL COMPOSITES

### COMPUTER

- COMPUTER
- COMPUTER PROGRAMS

### CONTAMINANTS

- CONTAMINANTS
- CONTAMINATED ENVIRONMENTS
- CONTAMINATION

## CORROSION

### CORROSION

- \*CORROSION INHIBITORS
- CORROSION PREVENTION
- CORROSION RESISTANCE
- HOT CORROSION
- STRESS CORROSION
- \*STRESS CORROSION CRACKING

### CRACKS

- ACOUSTICAL CRACKS
- \*CRACK ANALYSIS
- \*CRACK DETECTION
- CRACK FORMATION
- CRACK INITIATION
- CRACK PROPAGATION
- \*CRACK TIP PLASTIC ZONE
- CRACKS
- GRIFFITH CRACK
- \*PRE-CRACKED SPECIMENS
- \*STATIC CRACK GROWTH
- \*STRESS CORROSION CRACKING
- \*SUBCRITICAL CRACK GROWTH
- SURFACE CRACKS

### \*CREEP

- \*CREEP
- CREEP ANALYSIS
- CREEP PROPERTIES
- CREEP RESISTANCE
- \*CREEP RUPTURE
- CREEP RUPTURE STRENGTH
- CREEP STRENGTH
- \*CREEP STRENGTH DIAGRAMS
- CREEP TESTS
- \*CYCLIC CREEP
- TENSILE CREEP
- SHEAR CREEP

### CYCLES

- CYCLE LOADS
- CYCLES
- CYCLIC CREEP
- CYCLIC LOADS
- CYCLIC TEMPERATURE
- CYCLIC TESTING
- CYCLIC TORSION
- GROUND-TO-AIR CYCLES
- TEMPERATURE CYCLES
- THERMAL CYCLES

## D

### DAMAGE

- CUMULATIVE DAMAGE
- DAMAGE

- \*DAMAGED STRUCTURE LIFE
- \*LINEAR DAMAGE RULE
- DESIGN
  - AIRCRAFT DESIGN
  - DESIGN
  - \*DESIGN CODES
  - \*DESIGN CRITERIA
  - \*DESIGN GUIDES
  - \*DESIGN PROCEDURES
  - \*DESIGN STANDARDS
  - \*FAIL-SAFE DESIGN
  - \*SYSTEM DESIGN
- DUCTILITY
  - \*DUCTILE-BRITTLE TRANSITION
  - DUCTILE FRACTURE
  - \*DUCTILITY

**E**

- EFFECTS
  - BAUSCHINGER EFFECT
  - \*CUMULATIVE EFFECTS
  - ENVIRONMENTAL EFFECTS
  - \*FREQUENCY EFFECTS
  - \*JET ENGINE FUEL EFFECTS
  - \*NOTCH EFFECTS
  - TEMPERATURE EFFECTS
  - THERMAL EFFECTS
- ELASTICITY
  - AEROELASTICITY
  - AEROTHERMOELASTICITY
  - ELASTICITY
  - ELASTIC-PLASTIC ANALYSIS
  - ELASTIC PROPERTIES
  - ELASTIC STABILITY
  - MODULUS OF ELASTICITY
  - PHOTOELASTICITY
  - THERMOELASTICITY
- EMBRITTLEMENT
  - EMBRITTLEMENT
  - \*HYDROGEN EMBRITTLEMENT
  - \*HYDROGEN ENVIRONMENT EMBRITTLEMENT
  - \*HYDROGEN REACTION EMBRITTLEMENT
- ENGINEERING
  - ENGINEERING
  - \*ENGINEERING STANDARDS
  - ENVIRONMENTAL ENGINEERING
  - STRUCTURAL ENGINEERING
- ENVIRONMENTS
  - \*CONTAMINATED ENVIRONMENTS
  - \*ENVIRONMENTAL EFFECTS

- ENVIRONMENTAL ENGINEERING
- ENVIRONMENTAL TESTS
- ENVIRONMENTS
- HIGH TEMPERATURE ENVIRONMENTS
- \*HYDROGEN ENVIRONMENT EMBRITTLEMENT
- THERMAL ENVIRONMENTS

**F**

- FABRICATION
  - FABRICATION
  - \*FABRICATION METHODS
  - \*FABRICATION STANDARDS
- FAILURE
  - \*COMPONENT FAILURES
  - FAILURE
  - FAILURE ANALYSES
  - \*FAILURE INVESTIGATIONS
  - \*FAILURE MECHANISM
  - \*FAILURE MODE
  - \*FAILURE PREVENTION
  - \*FAILURE REPORT
  - \*FAILURES (MATERIALS)
  - STRUCTURAL FAILURE
- FATIGUE (MATERIALS)
  - ACOUSTIC FATIGUE
  - BENDING FATIGUE
  - FATIGUE (MATERIALS)
  - FATIGUE DIAGRAMS
  - FATIGUE LIFE
  - FATIGUE PROPERTIES
  - FATIGUE STRENGTH
  - \*FATIGUE TESTING MACHINES
  - FATIGUE TESTS
  - HIGH-CYCLE FATIGUE
  - LOW-CYCLE FATIGUE
  - \*ROLLING ELEMENT FATIGUE LIFE
  - \*SONIC FATIGUE
  - STRUCTURAL FATIGUE
  - THERMAL FATIGUE
- FIBERS
  - CARBON FIBERS
  - FIBER-REINFORCED COMPOSITES
  - FIBERS
  - GLASS FIBERS
- FRACTURES (MATERIALS)
  - \*DUCTILE FRACTURE
  - \*FRACTURE ANALYSIS
  - FRACTURE MECHANICS
  - \*FRACTURE PROPERTIES
  - FRACTURE RESISTANCE
  - FRACTURE STRENGTH



- \*FRACTURE TESTS
- FRACTURE TOUGHNESS
- FRACTURES (MATERIALS)
- \*MATERIAL FRACTURES
- PLANE STRAIN FRACTURE TOUGHNESS

## G

### \*GUIDES

- \*DESIGN GUIDES
- \*GUIDES
- \*INSPECTION GUIDES
- \*SAFETY GUIDES

## H

### HEAT

- AERODYNAMIC HEATING
- HEAT
- HEAT CONDUCTION
- HEAT EFFECTS
- HEAT OF DEGRADATION
- HEAT RESISTANT ALLOYS
- HEAT SHIELDING
- HEAT TREATMENT
- RESISTANCE HEATING

## I

### INDEXES

- INDEXES
- INDEXES (DOCUMENTATION)
- KWIC INDEXES

### INSPECTION

- INSPECTION
- \*INSPECTION GUIDES
- \*INSPECTION STANDARDS

### INSTALLATION

- INSTALLATION
- INSTALLATION MANUALS
- INSTALLATION PROCEDURES

## L

### LIFE (DURABILITY)

- \*BEARING LIFE
- \*DAMAGED STRUCTURE LIFE
- \*EXPECTED LIFE
- LIFE (DURABILITY)
- \*LIFE EXPECTANCY
- \*LIFE PREDICTION

### LOADS (FORCES)

- AERODYNAMIC LOADS

### AXIAL COMPRESSION LOADS

#### AXIAL LOADS

- \*BEARING LOADS
- \*BENDING LOADS
- \*COMBINED LOADS
- \*COMPRESSIVE LOADS
- \*CONSTANT LOADS
- \*CYCLE LOADS
- CYCLIC LOADS
- DYNAMIC LOADS
- \*LOAD CYCLES
- LOAD DISTRIBUTION (FORCES)
- LOADS (FORCES)
- PROGRAMMED LOADS
- \*RANDOM LOAD CYCLES
- RANDOM LOADS
- \*SHEAR LOADS
- STATIC LOADS
- \*TENSILE LOADS
- \*TORSIONAL LOADS

## M

### MANUALS

- \*ACCIDENT PREVENTION MANUALS
- \*INSTALLATION MANUALS
- \*OPERATING MANUALS
- MANUALS
- \*SAFETY MANUALS

### MATERIALS

- \*COMBUSTIBLE MATERIALS
- COMPOSITE MATERIALS
- \*DISPERSION STRENGTHENED MATERIALS
- HIGH TEMPERATURE MATERIALS
- \*LOW DENSITY MATERIALS
- \*MATERIAL DEFECTS
- \*MATERIAL DEGRADATION
- \*MATERIAL FRACTURES
- \*MATERIAL PROCESSING
- MATERIALS
- \*MATERIALS COMPATIBILITY
- \*METALLIC MATERIALS
- \*NONMETALLIC MATERIALS
- PHOTOELASTIC MATERIALS
- REFRACTORY MATERIALS

### METALS

- METAL ALLOYS
- METAL FOILS
- METAL MATRIX COMPOSITES
- \*METALLIC MATERIALS
- METALLOGRAPHY
- METALS

## METHODS

- \*ANALYSIS METHODS
- \*FABRICATION METHODS
- \*MAINTENANCE METHODS
- METHODS
- \*NDE METHODS
- \*NDI METHODS
- \*NDT METHODS
- \*STIFFNESS METHODS
- \*TESTING METHODS

## P

### PLASTICS

- \*CRACK TIP PLASTIC ZONE
- \*ELASTIC-PLASTIC ANALYSIS
- \*ELASTIC-PLASTIC MODULUS
- PLASTIC COATINGS
- PLASTIC DEFORMATION
- PLASTIC PROPERTIES
- \*PLASTIC STRAIN
- \*PLASTIC ZONE
- PLASTICITY
- PLASTICS

### PRESSURE

- \*EXCESSIVE PRESSURES
- \*OVERPRESSURIZATION
- PRESSURE
- PRESSURE OSCILLATIONS
- \*PRESSURE TANKS
- \*PRESSURE VESSEL CODES
- PRESSURE VESSELS
- \*PRESSURIZATION
- SURFACE PRESSURE

### PREVENTION

- ACCIDENT PREVENTION
- \*ACCIDENT PREVENTION MANUALS
- CORROSION PREVENTION
- \*FAILURE PREVENTION

### PROCEDURES

- \*ASSEMBLY PROCEDURES
- \*CLEANING PROCEDURES
- \*DESIGN PROCEDURES
- \*INSTALLATION PROCEDURES
- \*OPERATING PROCEDURES
- \*OVERHAUL PROCEDURES
- PROCEDURES
- \*STANDARD OPERATING PROCEDURES

### PROPERTIES

- BIAXIAL PROPERTIES
- CREEP PROPERTIES
- ELASTIC PROPERTIES

## FATIGUE PROPERTIES

- \*FRACTURE PROPERTIES
- MECHANICAL PROPERTIES
- PHYSICAL PROPERTIES
- PLASTIC PROPERTIES
- PROPERTIES
- SHEAR PROPERTIES
- SURFACE PROPERTIES
- TENSILE PROPERTIES

## R

### RESISTANCE

- ABRASION RESISTANCE
- \*BLAST RESISTANCE
- \*BLAST RESISTANCE CRITERIA
- CORROSION RESISTANCE
- CREEP RESISTANCE
- \*EROSION RESISTANCE
- FRACTURE RESISTANCE
- HEAT RESISTANT ALLOYS
- OXIDATION RESISTANCE
- \*OXIDATION RESISTANT COATINGS
- RESISTANCE HEATING
- THERMAL RESISTANCE

## S

### SAFETY

- \*FACTOR OF SAFETY
- \*FAIL-SAFE DESIGN
- \*MARGIN OF SAFETY
- SAFETY
- \*SAFETY CODES
- \*SAFETY CRITERIA
- SAFETY DEVICES
- \*SAFETY DIRECTIVES
- SAFETY FACTORS
- \*SAFETY GUIDES
- SAFETY HAZARDS
- SAFETY MANAGEMENT
- \*SAFETY MANUALS
- \*SAFETY POLICIES
- \*SAFETY PRACTICES
- \*SAFETY PRINCIPLES
- \*SAFETY REGULATIONS
- \*SAFETY SPECIFICATIONS
- \*SAFETY STANDARDS
- \*SAFETY SYSTEMS
- \*SAFETY TECHNOLOGY
- STRUCTURAL SAFETY
- \*SYSTEM SAFETY

## SHEAR

- \*ANTI-PLANE SHEAR
- SHEAR
- SHEAR CREEP
- SHEAR LIP
- SHEAR LOADS
- SHEAR PROPERTIES
- SHEAR STRAIN
- SHEAR STRENGTH

## SHOCK

- SHOCK
- SHOCK WAVES
- THERMAL SHOCK

## STANDARDS

- \*CALIBRATION STANDARDS
- \*DESIGN STANDARDS
- \*ENGINEERING STANDARDS
- \*FABRICATION STANDARDS
- \*INSPECTION STANDARDS
- \*MAINTENANCE STANDARDS
- \*OPERATING STANDARDS
- \*PERFORMANCE STANDARD
- \*SAFETY STANDARDS
- \*TESTING STANDARDS

## \*STRAIN

- AXIAL STRAIN
- \*PLANE STRAIN
- \*PLANE STRAIN FRACTURE TOUGHNESS
- \*PLASTIC STRAIN
- SHEAR STRAIN
- \*STRAIN
- STRAIN ACCUMULATION
- STRAIN AGING
- STRAIN DISTRIBUTION
- \*STRAIN ENERGY RELEASE
- STRAIN HARDENING
- STRAIN RATE
- STRESS-STRAIN DIAGRAMS
- UNIAXIAL STRAIN

## STRENGTH

- COMPRESSIVE STRENGTH
- CREEP RUPTURE STRENGTH
- CREEP STRENGTH
- \*DISPERSION STRENGTHENED MATERIALS
- FIBER STRENGTH
- FRACTURE STRENGTH
- HIGH STRENGTH
- HIGH STRENGTH ALLOYS
- IMPACT STRENGTH
- \*LOW STRENGTH STEELS
- NOTCH STRENGTH

## \*RESIDUAL STRENGTH

- SHEAR STRENGTH
- STRENGTH
- \*STRENGTH RETENTION
- STRESS RUPTURE STRENGTH
- TENSILE STRENGTH
- \*ULTIMATE STRENGTH
- YIELD STRENGTH

## STRESS

- \*ALLOWABLE STRESSES
- BIAXIAL STRESS
- COMBINED STRESS
- \*DYNAMIC STRESSES
- \*MEAN STRESS
- \*MONOTONIC STRESS
- \*OVERSTRESS
- \*PLANE STRESS
- \*RESIDUAL STRESS
- STRESS
- STRESS ANALYSIS
- STRESS CONCENTRATION
- STRESS CORROSION
- \*STRESS CORROSION CRACKING
- STRESS DISTRIBUTION
- STRESS INTENSITY FACTOR
- STRESS MEASUREMENT
- \*STRESS RAISERS
- STRESS RATIO
- STRESS RELAXATION
- \*STRESS RUPTURE
- STRESS-STRAIN DIAGRAMS
- TENSILE STRESS
- THERMAL STRESSES
- TORSIONAL STRESS
- \*UNIAXIAL STRESS
- YIELD STRESS

## T

## TEMPERATURE

- HIGH TEMPERATURE
- HIGH TEMPERATURE ALLOYS
- HIGH TEMPERATURE ENVIRONMENTS
- HIGH TEMPERATURE MATERIALS
- HIGH TEMPERATURE TESTS
- LOW TEMPERATURE TESTS
- LOW TEMPERATURE
- TEMPERATURE
- TEMPERATURE CYCLES
- TEMPERATURE DISTRIBUTION
- TEMPERATURE EFFECTS
- \*TEMPERATURE LIMITATIONS

\*TEMPERING TEMPERATURE  
\*VARIABLE TEMPERATURE  
TESTS  
\*BEND TESTS  
\*CHARPY IMPACT TESTS  
CREEP TESTS  
\*CYCLIC TESTING  
DYNAMIC TESTS  
\*FATIGUE TESTING MACHINES  
FATIGUE TESTS  
FLIGHT TESTS  
\*FRACTURE TESTS  
HIGH TEMPERATURE TESTS  
\*LABORATORY TESTS  
\*LEAK TESTING  
LOW TEMPERATURE TESTS  
\*NDT  
NOTCH TESTS  
\*PROOF TESTS  
STATIC TESTS

\*STORAGE TESTS  
\*TENSION TESTS  
\*TEST RESULTS  
\*TESTING METHODS  
\*TESTING SPECIFICATIONS  
\*TESTING STANDARDS  
TESTS  
VIBRATION TESTS  
\*WIND TUNNEL TESTS  
TURBINES  
GAS TURBINE ENGINES  
TURBINE BLADES  
TURBINES

## V

VEHICLES  
AEROSPACE VEHICLES  
VEHICLES